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**Traditional Roof Coverings in the North York
Moors National Park**

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Alan Scott has been a Chartered Building Surveyor for over 20 years with a broad experience of both public and private sectors. He was an associate partner with Peter Fall Cowie Associates, being responsible for building conservation work and was one of the first Chartered Surveyors to obtain the R.I.C.S. Diploma in Building Conservation. He has surveyed many listed buildings, developing an interest in vernacular architecture and specifically roofing matters. He has acted as a caseworker for S.P.A.B. and since 1993 has lectured at the University of Northumbria in Building Surveying and Building Conservation. He has published works regarding roofing matters previously.

Abstract

The paper deals with vernacular roofing practices within the North York Moors National Park. Initially it deals with the geography and geology of the area and identifying what makes it physically unique. The paper then examines the development of various roofing materials, including thatch, stone slates and pantiles with examples of old practice and modern methods from around the Park. The paper also shows the much regionalised nature of the roofing materials and recognises this as one of the special cultural features worthy of conservation.

Introduction

The North York Moors National Park occupies 143,603 hectares (Council for National Parks 2005) of a substantially upland land mass bounded by the North Sea to the east, the Yorkshire Wolds to the south, the Vale of Mowbray to the west and the conurbation of Teesside to the north. There are no towns within the Park and although Whitby is surrounded by Park it is specifically excluded. The area is substantially rural.

“The vernacular buildings and the unique villages are the most recognisable element of cultural distinctiveness” (North York Moors National Park 2005). Indeed, with 41 of the 91 villages being designated conservation areas, and the Park having almost 3,000 listed buildings (North York Moors National Park 2005), compared to only 1,740 in the Lake District, the area has a wealth of traditional buildings comparable to anywhere in England.

This richness of vernacular architecture is also reflected in the variety of the roofing materials. While limited indigenous fissile material exists, stone slating and Welsh slating occur in various places. Thatching was the dominant roofing material in the upland heart of the Park, but this has now been substantially replaced by pantiles found along most of the east coast of Great Britain, and used traditionally in the more basic and vernacular buildings of the Park.

This paper seeks to explore the origins and history of the various roofing materials together with any changes that may affect their future use. An understanding of the history of the materials will allow the building professional to ensure that craft techniques are maintained and ideally enhanced and that scarce natural resources are used most effectively. The National Park Authority recognises this, and within the 1998 Management Plan agreed “to maintain and enhance the special landscape characteristics of distinct areas within the North York Moors” (North York Moors National Park 1998). The built environment forms part of that “special landscape” and again the Park agreed “to raise awareness and understanding of the importance of the built environment to the National Parks landscape” (North York Moors National Park 1998). It is hoped this paper may assist in realising that objective.

Geography

“This is a land of plateaux, scarps and deeply incised rivers” (Peterken 2002). From the Vale of Pickering in the south, the land gradually rises to the high moorland culminating in Botton Head, the highest point on the moors. To the northern end of the Park the moors form an escarpment and gave its name to “Cleveland” from the Old Norse description “Cliffland”.

This high ground has produced relief rainfall averaging at over 1,000mm. in the central core (Met. Office 2005). This is substantially less than the Lake District where averages are over 2,500mm (Met. Office 2005). Reduced precipitation levels in the east have allowed single lap pantiles to be used successfully, while in the west of England slate, with its extra double skin protection is the norm.

The main valleys of Rosedale, Farndale and Bilsdale drain to the south and are deeply incised, being formed as a result of glacial melt water. Farming and estate ownership have tended to be along the valleys and as a result specific settlement patterns have developed which is recognised in the Management Plan of the Park Authority.

“Moorland comprises only two-fifths of the total area of the Park, yet this is the landscapes dominant feature” (Mitchell 1981). It is the largest tract of heather moor in England and would previously have provided heather for thatching of humbler dwellings.

(Take in Photograph 1, heather thatch house)

“Major monasteries were founded in the 11th and 12th century and led to the management of large-scale moorland grazing by sheep, setting the scene for the present day agricultural use of the area”(Morley 1997).

Today the land is substantially private (79.9%) and large scale conservation bodies have had little impact on the landscape. The National Trust which has had such an important effect on the conservation of vernacular buildings in the Lake District owns only 1.2% of the N.Y.M.N.P. This is compared to the National Trust ownership in the Lake District of 25.4% (Council for National Parks 2005).

Consequently, guidance and promotion of traditional roofing skills is left to the Park Authority planning team. The Ryedale Folk Museum, with over a dozen traditional buildings is the greatest concentration of vernacular architecture, albeit reconstructed buildings.

Geology

“The region forms one of the most natural divisions of Yorkshire, possessing its own special physical boundaries” (Elgie 1912). The geology is predominantly sedimentary from the Jurassic era, with only the Whinstone Ridge being the igneous rock basalt, this being quarried partly for road-stone purposes.

The sedimentary rocks were laid down up to 120 million years ago in tropical seas, and although uplift of the land mass has occurred, the beds are nearly horizontal. Consequently at coastal locations or deeply incised river valleys a range of rocks are visible, and this combined with the heavily fossilised rocks make the region one of the most geologically important in the U.K., promoted by the Park as “The Heritage Coast”.

The sedimentary rocks are formed into four distinct groups. The Lias Group, which is up to 440 metre thick is the oldest and comprises shales, sandstones and mudstones. It is easily eroded and where it is exposed at the coast has been subject to coastal erosion. Within the middle Lias it contains ironstone which has

been exploited since medieval times “the town of Middlesbrough grew entirely out of this industry” (Rayner 1974)

The next group is the Ravenscar Group, up to 250 metres deep formed in detrital conditions and compressed to give sandstones and shales. Today it is exposed on the high moor land to the north, giving rise to outcrops such as Wainstones. The sandstone is used in the building industry for walling, being easily cut and worked, but is not fissile and therefore unsuitable for roofing. Easy transportation from the coast, including Whitby, meant it was in demand by architects elsewhere and it was used in “The Houses of Parliament, Waterloo Bridge and Covent Garden” (North York Moors National Park 1993).

The sandstone is responsible for the poor quality of the soil on the moor, but the bottom of the dales are often more fertile due to the presence of Jurassic shales. Again this has been responsible for settlement patterns and subsequent vernacular styles.

The Middle Oolitic Group is up to 200 metres deep with layers of sandstone, clays and limestone. These were formed in generally shallow warm seas and today form the Tabular and Hambleton Hills to the south of the Park. They have been used for building purposes and around Coxwold fissile limestone occurs. As a result isolated areas have stone slates, adding again to the vernacular diversity of the Park.

Lastly the Kimmeridge Clay Group, with a maximum depth of 200 metres forms low ground to the Vale of Pickering to the south of the Park. They do not possess slate bearing rock.

Glaciation in the Quaternary Period (during the last 2 million years) has deposited clays, sands and gravel in some areas and as discussed melt water has eroded deeply incised valleys which generally flow to the south, or in the case of the Esk to the east and finally Whitby.

Consequently with only limited fissile material available, slating was scarce in the Park prior to the 19th century. Slating is found in clusters on the coastal villages, or used for more prestigious buildings where the cost of transport was acceptable, and this has been imported from Wales or the Lake District.

Thatch

“Thatch was the most common form of roof covering everywhere in Britain until the end of the medieval period and it remained the practical solution for many roofs in rural areas until the mid 19th century”(Brocket 1990)

The North York Moors is in a geographically isolated location and had “a particular local building style and a tradition of large estate land ownership” (Blizzard 2000). Consequently thatch continued as a roofing material well into the 20th century. Today however there are only approximately two dozen

thatched dwellings left in the Park and several of these are reconstructions related to Ryedale Folk Museum.

The region was ideally suited to thatch, “the Bronze Age, from about 2100BC, saw settlements spread into higher ground with major clearances of woodland” (Morley 1997). This gave the structural timber frame, “traditionally associated with single storey cruck framed dwellings” (Blizzard 2000).

The high moor land, now accounting for two-fifths of the Parks land mass, provided heather for thatch, while to the southern part of the Park straw was readily available.

The decline of the material in the 19th century was “affected by the practical and scientific advances of the agricultural and industrial revolutions” (Fearn 2004). In a survey of properties in Helmsley in 1868 it was noted that “...34 had recently been slated, 66 were thatched and 156 tiled” (Blizzard 2000). Today no thatched dwellings remain in Helmsley.

With a material at risk of disappearing completely the conservation programme of the Ryedale Folk Museum in Hutton-le-Hole must be applauded. They have reconstructed four main thatched dwellings in a variety of styles and materials. They also provide valuable educational resources and have published material on vernacular architecture, including thatching.

In 1998 a new property was built on the southern edge of the Park at Pockley. Becks Cottage is roofed with water reed imported from Turkey, with the ridge being Rye Straw from Yorkshire.

(Take in photograph 2 of Becks Cottage, Pockley)

Thatching material is very varied and again reflects the diversity between moor and dale landscapes.

“Ling or heather (*Calluna Vulgaris*) was widely used for thatching. It was harvested while in flower and laid with the roots entwined and pointed upwards” (Blizzard 2000). Both remaining examples are at the Ryedale Folk Museum, with Stang End originally being sited in Eskdale to the north of the Park. Turf is used as the base layer with heather thatch above, similar to the Scottish pattern found in the Western Isles.

(Take in photograph 3 of Stang End, Ryedale Folk Museum)

“Wheat (*Triticum sp*) is the material most often used today” (Blizzard 2000). Rye straw is also used, being visible at Hutton-le-Hole, Beadlam and Rievaulx and account for nearly half of the thatched properties in the Park.

(Take in photograph 4 of Swiss Cottage, Rievaulx)

“Common Reed (*Phragmites Australis*) is considered the best material for thatching” (Blizzard 2000). It can last for up to seventy years and Norfolk was

the traditional source within the British Isles. “Before the draining of the Plain of York and the Vale of Pickering, there would have been sufficient marshland to provide for local needs” (Blizzard 2000). At Beck Isle cottage in Thornton-le-Dale the water reed was imported from Hungary for the re-roofing.

(Take in photograph 5 of Beck Isle Cottage, Thornton –le-Dale)

Perhaps the most famous thatched cottage in the Park is at Runswick Bay on the coast. The cottage is roofed in reed, with the ridge finished in sedge (*Cladium Mariscus*) brought from Cambridge, as reed is unsuitable for forming ridges. It is in an exposed location directly adjacent to the sea, testament to the quality of reed as a thatching material.

(Take in photograph 6 of cottage at Runswick Bay)

Netting is commonly used to protect the thatch from birds and vermin. It is not there to restrain the thatch, and where trees are adjacent to the property can lead to damaging vegetation growth. With the fire risk of thatch it is usual to run the netting from ridge to eave with the galvanised wire mesh not overlapping. The netting can therefore be easily removed in emergencies.

One of the most interesting thatched properties in the Park is Spout House in Bilsdale, built around 1550 and leased by the Park Authority. It was re-roofed in 1979 with reed with a wheat straw ridge and over netted with wire. With access available internally the original crucks and fixing techniques are readily visible.

(Take in photographs 7 & 8 of Spout House, Bilsdale)

Stone Slating

Stone slating forms a much regionalised roofing type in the Park and is found predominantly to the west of the area. The slating is both indigenous Oolitic Limestone and regionally imported Carboniferous Sandstone and in Shandy Hall, Coxwold both materials are on the same roof although the limestone is the original covering.

(Take in photograph 9 of Shandy Hall, Coxwold)

Limestone slating is found in the south west of the park centred on the village of Coxwold where the local geology of Oolitic Limestone forms the Hambleton Hills. Very few properties exist with limestone slating, but include The Old Hall (1603), Shandy Hall and the Almshouses (1662). To the Old Hall the slates have been pointed in, similar to “shading” in Horsham Slate and to The Almshouses moss and house leeks are to be found.

(Take in photograph 10 of Old Hall and photograph 11 of Almshouses)

It is evident that limestone slating was more widespread, but has been replaced by more readily available material. At Carlton Husthwaite Church, just outside

the Park only the boiler room roof remains in limestone slating while the main roof of the church is replaced in Welsh slate.

(Take in photograph 12 of Carlton Husthwaite Church)

As there is "no source of authentic limestone slates and there is no reservoir for reclamation" (Hughes 2003) it may be expected problems of conservation may occur. As a replacement, limestone slating from the Cotswolds from geologically similar beds has been considered by English Heritage.

The Sandstone Stone slating used in the Park is imported, probably from Wensleydale in the Pennines and is Carboniferous Sandstone rather than the Jurassic Sandstone found within the Park. Due to high transportation costs the slate has been used only on key buildings, as at the Robert Thompson House, Kilburn and at Mount Grace Priory. The sandstone on Robert Thompson House is a replacement for the original Jurassic limestone slates.

(Take in photograph 13 of Robert Thompson House, Kilburn)

To the Hall at Mount Grace Priory the stone slating is used as a skirting course at eaves level with the remaining area of the roof being covered in a Sandtoft Greenwood Pantile. This regionalised style is matched on the eastern fringes of the Pennines and represents the transition between high ground dominated by stone slating and lower land of the Vale of York with its use of pantiles.

(Take in photograph 14 of Mount Grace Priory Hall)

Within the priory a Carthusian monk's cell has been recreated by English Heritage. As well as giving an indication of the lifestyles of the monks, it also shows construction methods prior to the Reformation. The stone slating is set to reducing courses with the slates fixed by oak pegs to riven laths in the classic traditional pattern. Lead is used for valleys, abutments and gutters. This is likely to have come originally from Wensleydale or Swaledale lead mines, the Church being large landowners in this area prior to the Reformation.

(Take in photographs 15 & 16 of Carthusian monk's cell)

Pantiles

Pantiles are the dominant roofing material in the North York Moors, producing uncomplicated roof slopes that are pleasantly relieved by dormer windows especially in the tightly packed cottages of the East Coast villages.

(Take in photograph 17 of Runswick Bay)

"Clay pantiles evolved from over and under tiles in 16th century Holland. Early examples came to England as ballast in old sailing ships. With strong trade links

between Britain and northern Europe, pantiles were soon imported regularly to the East Coast..." (Sandtoft 2003)

The tiles are found all along the eastern seaboard in both England and Scotland. In Northern England they extend westward as far as the foothills of the Pennines. They are rarely found in western counties except around Bridgewater in Somerset.

"The history of the manufacture of tiles for roofs in this country is obscure" (Innocent 1916). They continued to be imported until the second half of the 18th century. They were manufactured for a period in Whitby and continue to be made near the Humber estuary today.

The transition from thatch to pantiles occurred in areas with river or coastal access first but "it was towards the end of the 18th century that the pantiles appeared in the remoter dales" (Mitchell 1981). In some locations such as Rosedale, a property roofed in pantiles became known as 'Red House'.

In 1772, during the reign of George 1, the size of pantiles was governed by parliament "all pan-tiles made for sale in any part of England, shall when burnt be not less than 13½ inches long and not less than 9½ inches wide, but not less than half inch thick" (Innocent 1916).

Pantiles are manufactured from naturally occurring alluvial clay deposits. Colour variance is to be expected and the tiles will weather giving a richness of finish. "Handmade tiles are manufactured in such a way that their surface is more textured than that of a machine made pressed tile and for that reason the weathering process is more rapid"(Sandtoft 2003). In conservation work the Park Authority insists on new handmade tiles, not machine made and actively discourages reclaimed tiles.

The ridge was traditionally of stone, with the Ravenscar Group Sandstones being used for their close availability and ability to be easily worked to angular or hogs back shaped ridging. Again in conservation work retained ridges are insisted upon by the Park, although today clay ridging is more common.

A standard specification for pantiles is produced as follows "re-roofing in new handmade clay pantiles, not of interlocking type, sample to be approved prior to the start of work, hung on 50 X 25mm. battens... ridges and stone copings should be carefully removed and rebbed and pointed using a cement/lime mortar to a mix no stronger than 1:1:6" (North Yorkshire Moors National Park Authority 2004). Fixings are not specified by the Park, but "each tile should be nailed using the correct size alloy clout head nails. The nail should be driven fully home" (Sandtoft 2003)

Repair work with second hand tiles is advocated by The Society for the Protection of Ancient Buildings "with patch repairs, carefully sourced second-hand pantiles give a better fit than new ones" (S.P.A.B. 2002).

Intersections of roofs are rare on traditional pantile roofed buildings, partly due to the cost of lead work. The use of cat slide roofs is common and within cottage properties cat slide dormers are the typical vernacular style.

(Take in photograph 18 of Sandsend cat slide dormer)

Metamorphic Slating

Westmoreland slate has been used for the more prestigious buildings since the 17th century, especially for ecclesiastical properties such as Kilburn church. Welsh slate has also been used since the Georgian period along the coast, such as at Staithes with the slate being imported by sea. In the Victorian period with the expansion of the railways, Welsh slate was substantially used at the seaside towns of Whitby and Scarborough and around the accessible perimeter of the Park. The central core of the Park however remained dominated by pantiles. If slate is used in combination with pantiles, slate is the hierarchical superior, with pantiles subordinate, a principal still found today in planning guidance and exemplified at Kilburn.

(Take in photograph 19 of Kilburn)

Grant Aid has been given to Welsh slating as part of conservation projects, including £35,000 spent on slating in the last two years at Staithes (Dexter-Smith 2004). With grant work, a standard specification is used by the Park (North York Moors National Park 2004) and requires re-use of existing slates, with replacements matching existing. Westmoreland and Burlington are set to reducing courses in the traditional manner and the specification calls for copper nails for fixing to 50 X 25mm treated battens overlaying felt to B.S. 747. Any pointing to ridges and verges should be pointed with a maximum 1:1:6 cement/lime mortar.

Conclusions

The North York Moors has a wealth of listed buildings and these are predominately of the vernacular type to be found in the small villages and rural communities. Consequently the roofing styles have been simplistic and have steered away from the intricate and ornate in favour of the indigenous or readily available.

Thatch, once the major roofing material, is being lost or confined to museum exhibits. In some cases the thatch material is being changed and in some instances imported. With only approximately two dozen thatch roofs left perhaps the listed status of these properties should be raised from Grade II to Grade II*. This additional status on the basis of rarity value may allow additional funding to follow.

Compare this to Devon where the “County has about 4,000 thatched buildings” (Devon County Council 2003) and the regionalised nature of vernacular

architecture is evident. Both Devon and Hampshire County councils produce guides for thatching. For the North York Moors this may be excessive, but any raising of the awareness of the limited resource would be welcome.

The use of Jurassic stone slating is even more at risk with no source of replacement slate being present. Regional imports from the Cotswolds are advocated by English Heritage (Hughes 2003) in preference to the use of Carboniferous sandstone slates from the Pennine region as has been used at Kilburn and Shandy Hall, Coxwold.

Pantiles, being the most common roofing material are least at risk. The preferred handmade tile, in a selection of appropriate colours and tones is still available and even made locally by William Blyth to the south of the county at Barton-upon-Humber. Traditional East Coast features of cat slide roofs and dormers are all common, and again design guides to ensure authentic repairs could be produced, similar to Cotswold District Councils "Guide to Dormer Windows" (Cotswold District Council 1997). This need for guidance on traditional vernacular techniques is already identified by the Park "that the Authority produce guidance to property owners on conservation, maintenance, building techniques and design issues" (North York Moors National Park 1998).

There is limited grant aid for repair work within the Park. However, the Government are prepared to fund 80% of the cost of restoration of historic farm buildings under the Environmental Stewardship Scheme. If such finance could be extended to include rural communities generally it would be a step forward to preserving what "are the most recognisable element of our cultural distinctiveness" (North York Moors National Park 2005). With the roof being the most critical element of a building any conservation of its fabric will ensure that the rich tapestry of roofing is maintained for future generations.

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